916,240.

G. F. WILLIAMSON.

WINDMILL.

APPLICATION FILED FEB. 10, 1908.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.

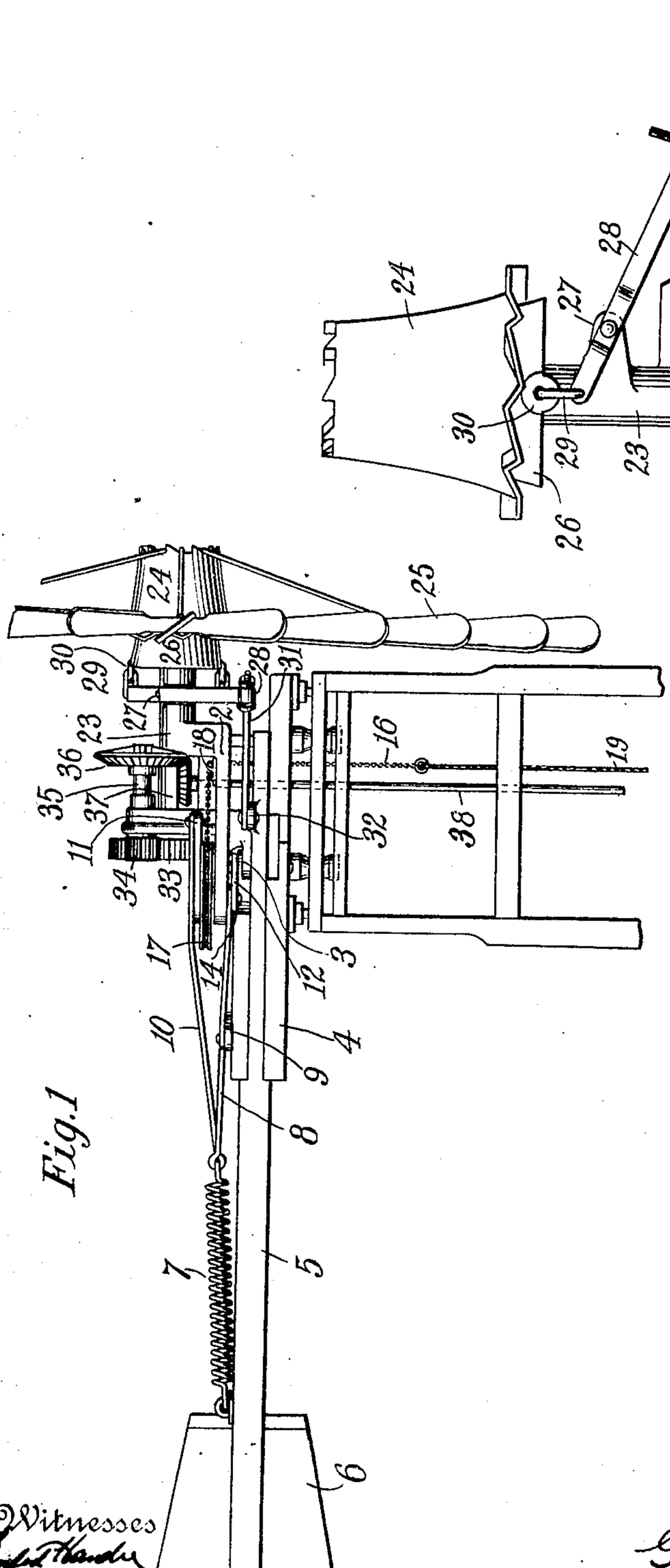

Fig. 1

Fig. 2

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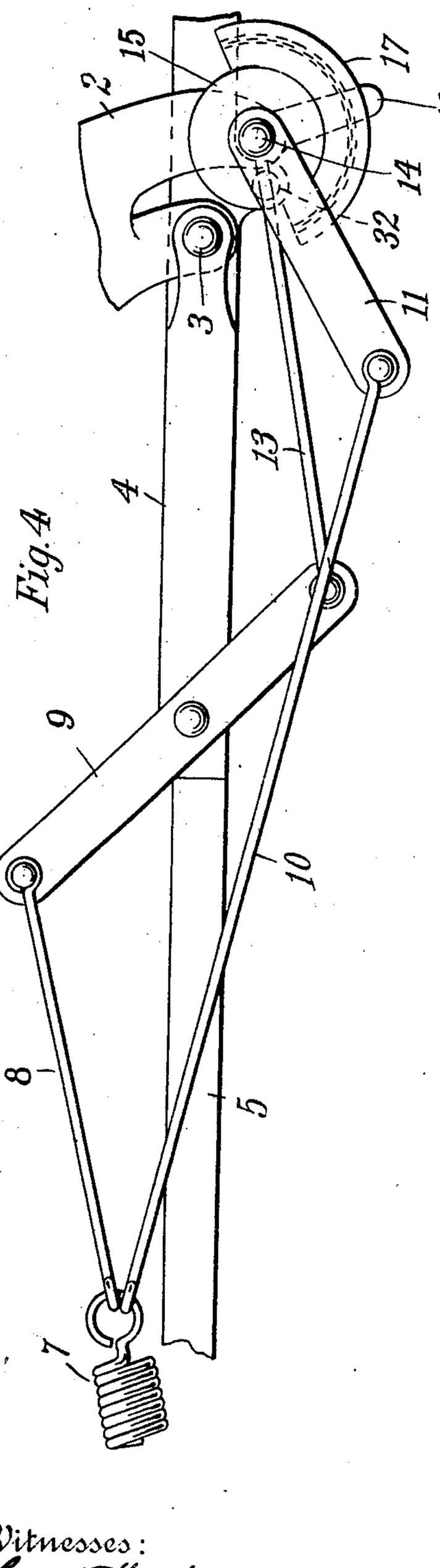

Fig. 4

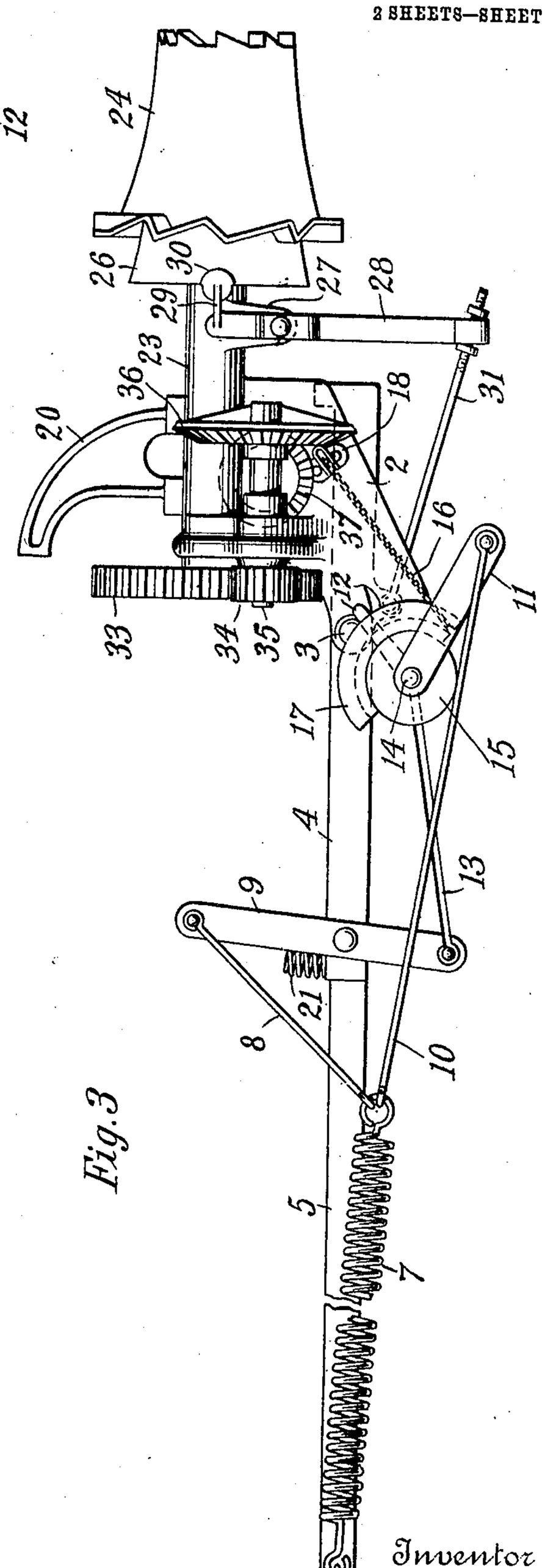

Fig. 3

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UNITED STATES PATENT OFFICE.

GEORGE FRANKLIN WILLIAMSON, OF BRANDON, MANITOBA, CANADA.

WINDMILL.

No. 916,240. Specification of Letters Patent. Patented March 23, 1909.

Application filed February 10, 1908. Serial No. 415,148.

To all whom it may concern:

Be it known that I, GEORGE F. WILLIAMSON, of the city of Brandon, Brandon county, Manitoba, Canada, and being a subject of the King of England, have invented certain new and useful Improvements in Windmills, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and to use the same, reference being had to the accompanying drawings, which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof will occur to persons skilled in the art.

This invention relates to certain new and useful improvements in windmills, and it relates more particularly to that class of windmills in which they are pulled into the wind, commonly called pull-in mills.

The object of the invention is to provide means for pulling them into the wind, and upon releasing the pull in wire or cable, the machine will go out of the wind of its own accord, and stop running, at the same time, providing means permitting the mill in a high wind to become partially out of gear without adjustment or releasing of the wire or cable by the operator, and the invention consists essentially of the devices hereinafter fully set forth and more particularly pointed out in the claims.

In the drawings: Figure 1 is a partial elevational view intended to show the general arrangement of the elements constituting my invention when in operation; Fig. 2 is a partial plan view showing the machine when not in operation; Fig. 3 is a view similar to Fig. 2 showing the position of parts when the machine is in operation, and Fig. 4 is a fragmentary enlarged detail view showing parts of the operating mechanism.

Referring to the parts: 2 represents the main frame of the windmill which is pivotally connected at 3 to the vane hinge casting 4 from which extends the tailbone or stem 5 to which is secured the usual vane 6, said tailbone and vane serving as a rudder. Secured at one end to the tailbone is a regulating spring 7 and to the opposite end of this spring is connected the pull-out rod 8 which rod is pivotally connected at its opposite end to the rocker arm 9. This rocker arm is pivoted, substantially midway its length to the said vane hinge casting 4 so as to be rockable thereupon. 10 is the pull-in rod which is connected at one end to said spring 7 while its opposite end is connected with the free end of the operating arm —11— through the chain 16 serving as an extension of said rod.

The arm 11 is pivotally mounted on an extension of the main frame 2, said arm —11— having a lateral extension 12 which serves as a stop when the parts are in the position shown in Fig. 3 that is, in the wind.

A push out rod 13 is connected to the end of the rocker arm opposite to that at which the pull-in rod 8 is connected, while the opposite end of said rod 13 is carried on the pivot 14 on which is carried the pulley 15 about which pulley is wound the furling chain 16, said pulley 15 being grooved to receive the chain 16 and also provided with cheek-pieces 17, which serve as guides for said chain 16. The chain 16 passes thence over the pulley 18 and is connected to the furling cable 19 which cable extends to, or in proximity to, the ground where it may be secured to any suitable fastening means.

The frame 2 is provided with a laterally extending stop arm 20 which is adapted to contact with the buffer spring 21 for the purpose of relieving shock when the tailbone and the main shaft of the wind-wheel come to a position where they are at right angles, as shown in Fig. 2.

Carried in the usual sleeve 23 is the main shaft, on one end of which is the wind-wheel 24, carrying the blades, which may be formed as shown at 25 or of any desired shape.

Coöperating with the wind-wheel, the hub of which is hollow, is the friction brake 26 which brake is adapted to pass into and engage, frictionally, with the inner face of said wheel hub and on the sleeve 23 is a lug 27 in which is pivotally mounted the brake lever 28 which is connected by the link 29 and ears 30 with the said brake-hub 26. Adjustably connected to the opposite end of this lever 28 is a brake rod 31 which rod is hung on a suitable pivot, passing through the lug 32 carried by the vane hinge casting 4 and forming an extension thereof.

On the inner end of the main shaft is a gear 33 in mesh with the pinion 34 on the shaft 35, on the opposite end of which shaft is a beveled gear 36 which meshes with the correspondingly beveled gear 37 on the shaft 38.

Assuming that the wind-mill is in the position shown in Fig. 2—out of the wind—and

it is desired to move it into the wind, draft is applied to the cable 19 and furling chain, 16 whereupon the spring 7 will be distended through the said chain, the lever 11 and pull-in rod 10 and chain 16 thus pushing on the rod 8 in the direction shown by the arrow in said Fig. 2 thereby rocking the arm 9 to the position shown in Fig. 3 and applying draft to the push-out rod 13 in the direction indicated by its associated arrow and carrying the chain pulley and lever 11 rearwardly so that the stop-lug 12 of said lever 11 will abut against the pivot bearing 3 to stop further progress thereof, at the same time shifting the spring 7 from one side of the tailbone to the opposite side thereof and swinging the main frame on its pivot so as to carry the wind wheel face directly into the face of the wind, at which time the chain 16 will rest in the grooved face of casting 17. While this result is being accomplished the brake rod 31 will push outwardly against the longer end of the brake lever 28 thereby rocking it on its pivot and withdrawing the brake-hub 26 from engagement with the interior of the wheel-hub 24, and permitting rotation of the wind wheel and associated gearing.

It will be understood that the ground end of the cable 19 is to be then properly secured.

When it is desired to stop the windmill, the operator releases the furl cable and chain whereupon the contraction of the spring 7 will cause it to pass back to the opposite side of the tailbone stem and the further contraction of said spring will rock the arm 9 thereby causing the push-out rod 13 to push against the main frame. This pushes the tailbone and main-frame apart so as to carry the tailbone and main shaft at right angles, or nearly so, until the stop 20 strikes the buffer spring 21. The spring then keeps the vane 6 and the edges of the blades 25 in alinement with the wind and the machine is out of gear. At the time the tailbone and main frame are swung out of alinement to normal inoperative position the brake will be set through the rod 31 and brake lever 28, to stop rotation of the wind-wheel.

From the foregoing it will be seen that to pull the machine into operative position the operator pulls upon the spring, through said cable etc. and when the cable is released the spring pulls the wheel and cable together as shown in Fig. 2 thereby automatically stopping the machine and setting the brake.

With the present construction frequent adjustment of the tension of the spring is not required as the tension thereof is automatically controlled by the operation in setting the machine into the wind.

As the relative position of the wind-wheel and tailbone are always subject to the tension of the spring 7 it is evident that said parts are self righting under the stress of exceedingly strong winds which might have a tendency to temporarily displace them and said spring will always automatically restore such parts to working position in operation of the machine.

What I claim is:

1. In a windmill, the combination comprising a pivotally connected main-frame and a rudder therefor, a yieldable spring connected with said rudder, a rocker-arm, a rod connecting said spring with said rocker-arm, a rod connecting the opposite end of said rocker-arm with said main-frame, a second rod connected with said spring, a second rockable member connected with said second rod and means for rocking said second rockable member.

2. In a windmill, the combination with a wind-wheel and a rudder, of a wheel carrying frame pivotally connected with said rudder, an expansion spring connected with said rudder, a rockable arm, a rod connecting said arm with said spring, a second rod connected with said spring, an operating arm carried by said frame and pivotally connected with said second rod and a rod connected with the opposite end of said rockable arm adapted to push the wind wheel and rudder into inoperative relation.

3. In a windmill, the combination with a wind-wheel and a rudder, of a wheel carrying frame pivotally connected with said rudder, a spring draft means adapted to place the wheel and rudder in operative relation when draft is applied in one direction and to restore said parts to inoperative position when such draft is released, said spring draft means comprising a rocker arm, rods connecting said rocker arm, the spring and wheel carrying frame, an operating arm and a rod connecting said operating arm and the spring, substantially as described.

4. In a pull-in windmill, the combination comprising a rudder and wind-wheel pivotally connected, a coil spring connected at one end with said rudder, a pull-in rod and a pull-out rod connected with the opposite end of said spring, a rocker arm on said rudder to which said pull-out rod is connected, a push-out rod connected to the opposite end of said arm, an operating arm connected with the opposite end of said pull-in rod and means for swinging said operating arm to pull the wind-wheel into the wind.

5. In a pull-in windmill, the combination comprising, a pivoted rudder, a pivoted wind-wheel frame, an expansible spring extending longitudinally of said rudder and connected thereto, a rocker arm pivotally mounted on said rudder, a pull-out rod connected with said spring and a push out rod connected to opposite ends of said arm, a pull-in rod connected with said spring, and an operating arm connected with said pull-in rod.

6. In a windmill, the combination com-

prising a movable rudder and windwheel frame, a wind wheel, an expansible spring on said rudder, a rocker arm mounted on said rudder, a pull-out rod and a push-out rod connecting said rocker arm with the spring and wind wheel frame, an operating arm carried by said wind wheel frame, a rod connecting said arm and the spring and means for swinging said operating arm to pull said wind wheel into the wind.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

GEORGE FRANKLIN WILLIAMSON.

Witnesses:

V. N. LATIMER,

A. E. HETHERINGTON.